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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Nicholas L. Abbott

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EXAMINER

LUNDGREN, JEFFREY S

ART UNIT

PAPER NUMBER

1639

MAIL DATE

DELIVERY MODE

03/01/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/044,899	Applicant(s) ABBOTT ET AL.	
	Examiner JEFFREY S. LUNDGREN	Art Unit 1639	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 October 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 129-202 is/are pending in the application.
- 4a) Of the above claim(s) 129-143 and 158-202 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 144-157 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

Status of the Claims

Claims 129-202 are pending in the instant application; claims 129-143 and 158-202 are withdrawn from consideration; claims 144-157 are the subject of the Office Action below.

Claim Rejections - 35 USC § 112 – Written Description

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The rejection of claims 144-157 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement, is maintained. The claims contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had full possession of the claimed invention. Applicants invention is not adequately described for the full breadth, and is limited to mesogenic liquid crystals encapsulated between two substrates prepared on anisotropic gold hosting an organic self-assembled monolayer, and detection using polarized light or optical spectroscopy and transmission.

Applicants allege that the claimed invention was sufficiently described at the time it was filed and point to certain generic descriptions in the specification. Applicants also provide a declaration by inventor Dr. Nicholas Abbott that simply disagrees with the Examiner's conclusion.

However, none of the sections in the disclosure highlighted by Applicants provides any insight into the scientific principles of such a device and how it would truly be functional as claimed in its full breadth. The rejection is maintained and reiterated below.

The claimed invention:

Applicants invention is directed towards a method for detecting an analyte, comprising: contacting with said analyte a recognition moiety for said analyte, wherein said contacting causes at least a portion of a plurality of mesogens proximate to said recognition moiety to detectably

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switch from a first orientation to a second orientation upon contacting said analyte with said recognition moiety; and detecting said second orientation of said at least a portion of said plurality of mesogens, whereby said analyte is detected.

The supporting disclosure:

Applicants disclosure suggests that the invention is useful for various biosensor applications. The biosensors are generally based on liquid crystal based sensors wherein the alignment of the mesogenic layers is affected by the presence of absence of analyte and is highly sensitive to low levels of analyte.

Applicants generally describe a number of substrates to host the biosensor layer:

“Substrates that are useful in practicing the present invention can be made of practically any physicochemically stable material. In a preferred embodiment, the substrate material is non-reactive towards the constituents of the mesogenic layer. The substrates can be either rigid or flexible and can be either optically transparent or optically opaque. The substrates can be electrical insulators, conductors or semiconductors. Further the substrates can be substantially impermeable to liquids, vapors and/or gases or, alternatively, the substrates can be permeable to one or more of these classes of materials.

Exemplary substrate materials include, but are not limited to, inorganic crystals, inorganic glasses, inorganic oxides, metals, organic polymers and combinations thereof.”

Specification, paragraphs 0145 and 0146; and the substrate surface:

“The nature of the surface of the substrate has a profound effect on the anchoring of the mesogenic layer which is associated with the surface. The surface can be engineered by the use of mechanical and/or chemical techniques.”

Specification, paragraph 0164.

Each of Applicants working examples is directed to substrate surfaces that have anisotropic gold (see Examples 1-6).

The State of the Art, Relevant Facts and Applicants Lacking Disclosure:

For the type of sensors that relate to the claimed invention, each requires anisotropic gold hosting an organic self assembled monolayer. For example, see Gupta *et al.*, *Science*, 279:2077-2080 (1998); Clare *et al.*, *Langmuir*, 22:7776-7782 (2006); Clare *et al.*, *Langmuir*, 22:4654-4659

(2006); Govindaraju *et al.*, *JACS*, 129:11223-11231 (2007); and Lowe *et al.*, *Analytical Chemistry*, 80:2637-2645 (2008).

See also the Abbott Declaration filed in U.S. Patent Application Serial No. 10/934,023, signed on June 11, 2008, that indicates that the liquid crystal based biosensors of the instant application are dependent on the anisotropic gold substrate surface and organic self assembled monolayers.

Absent evidence to the contrary in Applicants disclosure, the full breadth of the claimed invention is not supported.

Conclusions

No claim is allowable.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

If Applicants should amend the claims, a complete and responsive reply will clearly identify where support can be found in the disclosure for each amendment. Applicants should point to the page and line numbers of the application corresponding to each amendment, and provide any statements that might help to identify support for the claimed invention (*e.g.*, if the amendment is not supported *in ipsis verbis*, clarification on the record may be helpful). Should

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Applicants present new claims, Applicants should clearly identify where support can be found in the disclosure.

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Jeff Lundgren whose telephone number is 571-272-5541. The Examiner can normally be reached from 7:00 AM to 5:30 PM.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Christopher Low, can be reached on 571-272-0951. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Jeffrey S. Lundgren/

Primary Examiner, Art Unit 1639